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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,284

07/14/2008

Martin Schlegl

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EXAMINER

TIETJEN, MARINA ANNETTE

ART UNIT

PAPER NUMBER

3753

MAIL DATE

DELIVERY MODE

07/21/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,284	Applicant(s) SCHLEGL ET AL.	
	Examiner MARINA TIETJEN	Art Unit 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-17, 19 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-17, 19 and 24-31 is/are rejected.
- 7) ☒ Claim(s) 22-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/14/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 07/14/2010 is acknowledged by the Examiner.

Response to Amendment

2. This office action is responsive to the amendment filed on 06/30/2010. As directed by the amendment: claims 11 has been amended, claims 1-10, 18, 20 and 21 have been cancelled, and new claims 24-31 have been added. Thus, claims 11-17, 19, 22-31 are presently pending in this application.

Response to Arguments

3. Applicant's arguments with respect to claims 11-17, 19, 22-31 have been considered but are moot in view of the new ground(s) of rejection. The amendment "a continuous transition is brought about in a connection region between the longitudinal portion and the end of greater diameter of the valve cone" to claim 1 is newly presented and affects the scope of the claim, thereby necessitating the new ground of rejection.

Drawings

4. The drawings are objected to because the arrow of recess 9 does not seem to point to the recess which serves as a centering or supporting seat for the valve cone end. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in

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reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 28 is objected to because of the following informalities:
- Claims 26-29 and 31 refer to the "stem connection element" as a "stem connect element".
 - Claim 28 is identical in scope to claim 26, with both claims depending on claim 24.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 11-17, 19, 24-28,30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al. (U.S. Pat. No. 5,413,073) in view of Schwaiger (DE 3625590) further in view of Leiber (WO 99/05397).

Larson et al. disclose a lightweight valve comprising:

a valve stem (12);

a hollow valve cone (16) with a hollow space having an end of greater diameter (end which welds at 24), the end having an inner circumference, an outer circumference and an end face (weld 24 is located between end face and disk cap member 14) between the inner circumference and the outer circumference; and

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a valve disk (14, fig. 2b) closing the hollow space on one side and having a flat side (23 is flat when a and b equal 0) facing the valve cone (16);

the valve disk (14) having a longitudinal portion (forms 20) extending from the flat side of the valve disk (14), the flat side of the valve disk and the longitudinal portion defining a recess (which creates 25) serving as a centering or supporting seat for receiving the end of greater diameter of the valve cone (16), the valve disk including a step (radially inward of 25) extending upward from the flat side of the valve disk (14), the step including an angled surface (step shown as having a slight angle in fig. 7a) that is angled with respect to the flat side of the valve disk (14), the angled surface supporting the inner circumference of the end of greater diameter of the valve cone (16), the longitudinal portion (20) supporting the end face of the end of greater diameter (on surface 25) of the valve cone (16), the longitudinal portion (20) being frustoconical and a having a cone angle that is the same as a cone angle of the valve cone at the end of greater diameter such that a continuous transition (a continuous transition is shown in assembled close-up view of fig. 7a) is brought about in a connection region between the longitudinal portion (20) and the end of greater diameter of the valve cone (16);

wherein the valve cone (16) is of disk-spring-shaped design;

wherein the valve is an internal combustion engine valve;

wherein the longitudinal portion (20) of the valve disk (14) and the end face of the end of greater diameter of the valve cone (16) are shaped to come into contact without forming a connection (weld 24 forms the actual connection);

wherein the outer circumference of the end of greater diameter of the valve cone does not contact the valve disk (14); and

wherein the valve cone (16) and the valve disk (14) are shaped such that the valve cone and the valve disk are alignable with each other before the valve cone and the valve disk are materially connected.

However, Larson et al. do not disclose wherein the step is clearly angled; wherein the valve stem is connected to a stem connection element formed on or fastened to the valve disk; wherein a valve cone support is located at a distance from the valve disk and provided in the hollow space, the valve cone support being located on the stem connection element and projecting above the flat side; wherein the valve cone support includes at least one supporting surface bearingly contacting an inner wall region of the valve cone; wherein a contour of the supporting surface complements the inner wall region; wherein the valve cone-support is formed by a thickening on the stem connection element; and wherein the valve cone has at a smaller diameter end a tubular projection for guiding through the valve stem or the stem connection element; wherein the valve cone-support forms a centering or supporting seat for the valve cone; wherein the valve cone, the valve disk and the valve stem are shaped such that the valve cone is slidable over the valve stem so the end face of the end of greater diameter of the valve cone is brought into contact with the longitudinal portion of the valve disk after the valve disk is connected to the valve stem; wherein the stem connection element is arranged on the valve disk to fix a vertical position of the valve cone relative to the valve disk as the end face of the end of greater diameter of the valve cone is

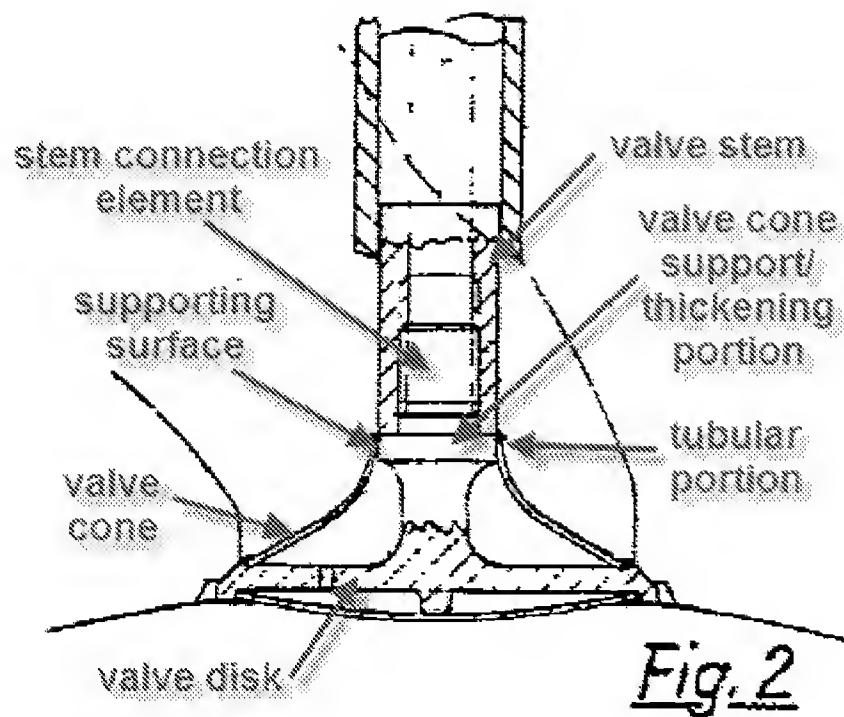
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brought into contact with the longitudinal portion of the valve disk; wherein the stem connection element is shaped such that the valve cone is slidable over the stem connection element so the end face of the end of greater diameter of the valve cone is brought into contact with the longitudinal portion of the valve disk after the valve disk is connected to the stem connection element; and wherein the stem connection element is shaped such that the valve cone, the valve disk and the stem connection element are alignable with each other before the valve cone, the valve disk and the stem connection element are materially connected.

Schwaiger teaches a valve wherein a valve stem (see labeled fig. 2 below) is connected to a stem connection element (see labeled fig. 2 below) formed on a valve disk (see labeled fig. 2); wherein a valve cone support (see labeled fig. 2 below) is located at a distance from the valve disk and provided in a hollow space of a valve cone, the valve cone support being located on the stem connection element and projecting above the flat side; wherein the valve cone support includes at least one supporting surface (see labeled fig. 2 below) bearingly contacting an inner wall region of the valve cone; wherein a contour of the supporting surface complements the inner wall region; wherein the valve cone-support is formed by a thickening (as shown in fig. 2) on the stem connection element; and wherein the valve cone has at a smaller diameter end a tubular projection (see labeled fig. 2) for guiding through the valve stem or the stem connection element; wherein the valve cone-support (labeled fig. 2) forms a centering or supporting seat for the valve cone; wherein the valve cone, the valve disk and the valve stem are shaped such that the valve cone is capable of sliding over the valve stem so

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the end face of the end of greater diameter of the valve cone is brought into contact with the valve disk after the valve disk is connected to the valve stem; wherein the stem connection element (labeled fig. 2) is arranged on the valve disk to fix a vertical position of the valve cone relative to the valve disk as the end face of the end of greater diameter of the valve cone is brought into contact with the valve disk; wherein the stem connection element (labeled fig. 2) is shaped such that the valve cone is capable of sliding over the stem connection element so the end face of the end of greater diameter of the valve cone is brought into contact with the valve disk after the valve disk is connected to the stem connection element; and wherein the stem connection element (labeled fig. 2) is shaped such that the valve cone, the valve disk and the stem connection element are capable of being aligned with each other before the valve cone, the valve disk and the stem connection element are materially connected, for the purpose of providing means for adding rigidity and structural support for the hollow valve cone and for the purpose of providing the ability for the valve disk and cone to be removable from the valve stem, and therefore replaceable.



It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Larson's invention such that the valve stem is connected to a stem connection element formed on or fastened to the valve disk; wherein a valve cone support is located at a distance from the valve disk and provided in the hollow space, the valve cone support being located on the stem connection element and projecting above the flat side; wherein the valve cone support includes at least one supporting surface bearingly contacting an inner wall region of the valve cone; wherein a contour of the supporting surface complements the inner wall region; wherein the valve cone-support is formed by a thickening on the stem connection element; and wherein the valve cone has at a smaller diameter end a tubular projection for guiding through the valve stem or the stem connection element; wherein the valve cone-support forms a centering or supporting seat for the valve cone; wherein the valve cone, the

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valve disk and the valve stem are shaped such that the valve cone is slidable over the valve stem so the end face of the end of greater diameter of the valve cone is brought into contact with the longitudinal portion of the valve disk after the valve disk is connected to the valve stem; wherein the stem connection element is arranged on the valve disk to fix a vertical position of the valve cone relative to the valve disk as the end face of the end of greater diameter of the valve cone is brought into contact with the longitudinal portion of the valve disk; wherein the stem connection element is shaped such that the valve cone is slidable over the stem connection element so the end face of the end of greater diameter of the valve cone is brought into contact with the longitudinal portion of the valve disk after the valve disk is connected to the stem connection element; and wherein the stem connection element is shaped such that the valve cone, the valve disk and the stem connection element are alignable with each other before the valve cone, the valve disk and the stem connection element are materially connected, as taught by Schwaiger, for the purpose of providing means for adding rigidity and structural support for the hollow valve cone and for the purpose of providing the ability for the valve disk and cone to be removable from the valve stem, and therefore replaceable.

However, Schwaiger does not teach wherein the step is clearly angled.

Leiber teaches a valve disk wherein the step (see labeled fig. 3) is clearly angled for the purpose of the step providing a better seating surface that contours the valve cone.

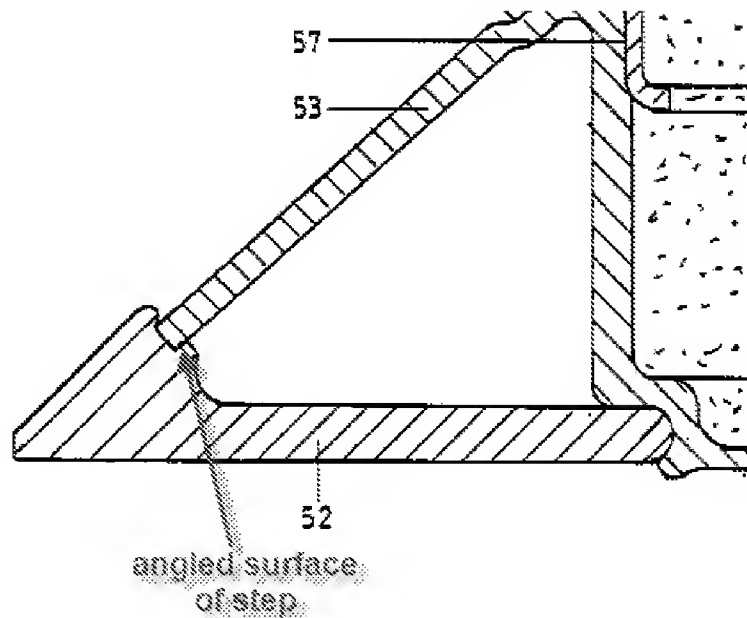


Figure 3

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Larson's invention such that the step is clearly angled, as taught by Leiber, for the purpose of the step providing a better seating surface that contours the valve cone.

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al. (U.S. Pat. No. 5,413,073) in view of Schwaiger (DE 3625590) further in view of Leiber (WO 99/05397) further in view of Nishiyama et al. (U.S. 4,834,036).

Larson discloses the invention as essentially claimed, except for wherein the valve disk and the stem connection element are made from intermetallic phase titanium aluminide or a titanium aluminide alloy.

Nishiyama et al. teach it is well known in the art to use titanium aluminide alloys for elements of intake and exhaust valves because of the low specific gravity being

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equivalent to 48 to 61% of that of steel and the oxidation resistance at high temperatures (col. 1, lines 19-24).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Larson such that the valve disk and the stem connection element are made from a titanium aluminide alloy, as taught by Nishiyama et al., to provide a valve having the excellent properties of a low specific gravity equivalent to 48 to 61% of that of steel and oxidation resistance at high temperatures, in a manner known in the art.

Allowable Subject Matter

10. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARINA TIETJEN whose telephone number is (571) 270-5422. The examiner can normally be reached on Mon-Thurs, 9:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ROBIN EVANS can be reached on (571) 272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John Rivell/
Primary Examiner, Art Unit 3753

/M. T./
Examiner, Art Unit 3753

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